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ASSESSMENT OF SOIL ORGANIC CARBON STOCK IN SEA GRASS BEDS OF GAZI BAY, KENYA

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Seagrasses are marine angiosperms inhabiting coastal areas from the intertidal zone to several tens of meters deep in all the continents except Antarctica showing relatively higher species diversity in the tropical regions than temperate. They provide important ecosystem goods and services like sediment stabilization, provide habitat for marine organisms and have also been recognized for their capacity to sequester and store carbon in the sediment for a long time through the accumulation of autochthonous and the allochthonous carbon. This study determines the organic carbon stock in the four dominant seagrass species (*Thalassodendron ciliatum, Syringodium isoetifolium, Enhalus acoroides and Thalassia hemprichii*) of Gazi Bay. Coring extending to 1m deep was done within quadrats of 0.5m by 0.5m using a Russian peat sampling corer. The cores were sliced into 5cm interval and taken to the laboratory for wet-dry weight conversion. Sub-samples of 5g were analysed for organic matter (LOI). General equations for the relationship between %LOI and %Corg in seagrass (%C_{org}= 0.43*%LOI-0.33) r^2= 0.96 for seagrass soils with %LOI >0.2 and (C_{org}= -0.21+0.40*%LOI) r^2= 0.87 in seagrass soils with %LOI <0.2 were used to calculate the Corg stock in each species. The study tested the differences in % organic matter for vegetated and unvegetated sites, and the carbon stock among species using single factor analysis of variance (ANOVA). In T. hemprichii, the % organic matter was significantly different between the seagrass vegetated and the un-vegetated areas ($F_{(1, 180)}$ = 13.54; p =0.002) but not with depth in both the seagrass vegetated and un- vegetated areas ($F_{(9, 180)}$ =0.85; p =0.567). In T. ciliatum, the % organic matter was highly significantly different between the seagrass vegetated and the un-vegetated areas ($F_{(1, 180)}$ = 123.84, $p < 0.001$) but was not statistically significantly different with depth between the seagrass vegetated and unvegetated areas ($F_{(9, 180)}$ = 0.60; p = 0.794). In E. acoroides, the % organic matter was highly significantly different between the seagrass vegetated and the un-vegetated areas ($F_{(1, 180)}$ = 13.54; p = 0.002) but was not significantly different with depth between the seagrass vegetated and un- vegetated areas ($F_{(9, 180)}$ = 1.01; p = 0.437. In S. isoetifolium, the % organic matter was highly significantly different between the seagrass vegetated and the un-vegetated areas ($F_{(1, 180)}$ = 179.62; $p < 0.001$) but was not significantly different with depth between the seagrass vegetated and un- vegetated areas ($F_{(9, 180)}$ = 0.21; p = 0.983). Sediment Corg was highly significantly different between species ($F_{(3, 56)}$ = 4.269, p=0.005). The results of this study shows the important role of seagrass in climate change mitigation and can therefore be used to advice current and future ecosystem conservation planning.

Biography

Okoth Reagan has completed his BSc at the age of 23 years from Kenyatta University Kenya. He is currently an Intern at Taita Taveta Research and Resource Arc under the Adaptation for Ecosystem Resilience in Africa (AFERIA) project coordinated by International Centre for Insect Physiology and ecosystem (ICIPE) a premier research organization.

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